GARDEN AND FOREST.

PUBLISHED WEEKLY BY

THE GARDEN AND FOREST PUBLISHING CO.

OFFICE: TRIBUNE BUILDING, NEW YORK.

Conducted by . . . . . Professor C. S. SARGENT.

ENTERED AS SECOND-CLASS MATTER AT THE POST OFFICE AT NEW YORK, N. Y.

NEW YORK, WEDNESDAY, FEBRUARY 27, 1889.

TABLE OF CONTENTS.

PAGE.

EDITORIAL ARTICLES:—Forest Lands of New York.—Extension of the Park System of Minneapolis and St. Paul.—Mr. Schurz's View of our Forestry Problem.—Preservation of Casa Grande 97
The Terrace Garden at Wellesley (with illustration) 98
Sweet Cassava in Florida . . . . . *A. H. Curtiss.* 99

FOREIGN CORRESPONDENCE:—London Letter . . . . . *W. Watson.* 100

NEW OR LITTLE KNOWN PLANTS:—Japanese Chrysanthemum—Medusa (with illustration) . . . . . *C. S. S.* 100

CULTURAL DEPARTMENT:—Green-house Plants.—I. Correas . . . . . *W. Watson.* 101
Roses.—Shallow Benches or Solid Beds for Forcing Roses . . . . . *W.* 102
Shrubby Begonias . . . . . *John Thorpe.* 102
Orchid Notes . . . . . *F. Goldring, A. Dimmock.* 103
Some Choice Narcissus . . . . . *E. O. Orpet.* 104

Principles of Physiological Botany. IX . . . . . *Professor George Lincoln Goodale.* 104

THE FOREST:—The Forests of Michigan 105

CORRESPONDENCE:—Forest Changes in Rhode Island . . . . . *Henry H. Northrop.* 105

RECENT PUBLICATIONS 106

PERIODICAL LITERATURE 107

NOTES 108

ILLUSTRATIONS:—Japanese Chrysanthemum—Medusa. Fig. 97 101
The Terrace Garden at Wellesley 103

State Forest-lands of New York.

THE Annual Report of the New York Forest Commission for the year ending September 30th, 1888, recommends legislative action to exclude railroads from state-lands, to enable the state to acquire forest-lands by purchase, and to encourage a system of tree planting and forest culture. The proposal that all building of railways on state-lands within the forest-preserve shall be prohibited, and all existing laws permitting state-land to be taken as a right of way for railroads shall be repealed, is entirely judicious, and its practical bearings are important. There has been too much railroad building on the state forest-lands already, and no more should be permitted. The Commission recommends the appropriation from the state treasury of a certain amount for the purchase by the Board of Land Commissioners, upon the recommendation of the Forest Commission, in the name of the state, of forest or wild lands, at a price not to exceed one dollar and fifty cents per acre, and in amount not to exceed in expenditure the annual appropriation for such purchase. If the state can acquire an absolute title to any considerable quantity of land on these terms, and can take care of it afterwards so that forest conditions shall be restored and maintained upon it, this would be a step in the right direction.

The Commission asks for an appropriation to encourage and begin "a system of tree planting and forest culture," and thinks a beginning could be made at a comparatively small expense. Undoubtedly the beginning could be made so small that it would cost very little, but if the system were continued and extended it would probably be at once the costliest and the most useless enterprise ever undertaken by the state of New York. The scheme is a visionary one, and the work which it proposes is unnecessary. If the denuded tracts are protected from fire, from pasturage and other injuries, nature will reclothe them with forests much more rapidly than it can be done by tree planting under the direction of the Forest Commission. The proposal illustrates the need of some degree of special knowledge and training in the management of forest interests of such importance. An appropriation for such a purpose would not only be thrown away, but would tend to divert attention from the real requirements of the Adirondack region.

The Commission also desires to obtain authority to lease portions of the state-lands to individuals who wish to appropriate to their own use and enjoyment pleasant sites for residences on land which belongs to the state. This is a mischievous proposition. No authority to lease the state-lands for such purposes should be given to anybody. Some arrangement for hotels and lodging-houses for sheltering the multitudes of people who use the region as a summer-resort is, of course, indispensable, but beyond this there is no good reason for permitting residence on the state-lands. If a few persons are to be admitted to such residence, there is no sufficient ground for excluding others, and in a few years the best portions of the forest-region owned by the state will thus be wrongfully appropriated to private uses, and the value of the wilderness as a sylvan resort and sanitarium will be seriously impaired. No facilities should be granted for increasing the number of residents on the property of the state. Those who are there already, the "custodians" on the islands in Lake George, and the squatters on sites along the shores of the Adirondack lakes, should be required to vacate these places at once, no matter how much wealth, or social and political influence, they may be possessed of.

A joint committee of the Board of Trade of Minneapolis and the Chamber of Commerce of St. Paul recently adopted a resolution, which they will present to the Legislature, regarding the extension of the park systems of the sister cities. It is proposed to form a great River Park extending for a considerable distance along both banks of the Mississippi, and including the islands in its stream. The idea is to take a strip of shore averaging some 300 feet in width, but extending further inland at certain points where ravines and water-courses occur; to construct a stately boulevard, on the inward side of which residences will be built, and to preserve all the land between it and the water as ornamental grounds. Boulevards already exist on the St. Paul side, which would form a continuation of the new one and unite it with the remainder of the park system of the town. The existing State Park, on the Minneapolis side—which includes the Falls of Minnehaha—and the Fort Snelling military reservation, which may easily be opened to the public, can likewise be connected with the new work. The boulevard can be so disposed as to afford not only extensive views of the river, but glimpses down its steep banks in certain spots; and at the foot of these banks there are places which can be effectively laid out, and sometimes even give room for accessory drives, while their slopes are already beautifully wooded with a variety of large trees. Mr. Cleveland has sketched a plan to show what the general effect of the scheme would be, and even from hearsay one can understand why local journals predict in its accomplishment the grandest park in the world. The wonderful beauty of the Riverside Park, in New York, is too well known to be insisted upon; and although the upper waters of the Mississippi have not the grandeur, of course, of the Hudson near its mouth, they are very beautiful, and a vast gain will spring from the fact that not one side merely, but both, can be utilized. Too many charming river-fronts have already been sacrificed in America to the supposed needs of trade or to mere shiftless neglect; and it will be a serious mistake if the authorities of Minneapolis and St. Paul do not preserve their own in the manner now suggested. As Mr. Cleveland points out, the thing must be done now if it is to be done at all. If time is lost, buildings will intrench on the desired locality and the fine forests along the river will be ruined past repair. These wooded tracts, as Mr. Cleveland writes, instead of being the richest ornament, will become the most unsightly portion of the suburbs, "and future generations will only deplore the want of forethought which might have saved without cost such features

of natural beauty as no money could purchase and no art could presume to imitate."

Mr. Carl Schurz is well known as an ardent advocate of change in our national policy in many matters connected with the tariff, taxation and trusts, and yet in his recent address before the Commonwealth Club of this city, he declared, as the result of his deliberate judgment, that the forest problem was more important in its ulterior consequences than were other economical questions. "If I had the power," he said, "to choose for the country between an immediate reduction of tariff duties on the one hand and the introduction of an effective forest policy on the other, I should say, 'Let the people be burdened a little longer by protected interests, for at a future day they can change their system and retrieve their losses,' rather than let the destruction of our forests go on at the present rate, for that destruction may bring on a train of disaster from which the country may never recover." It is not the purpose of Garden and Forest to take part in the discussion of questions which divide the political parties of the country. The words of Mr. Schurz are quoted to invite attention to the estimate of the paramount importance of the national forest problem made by a man who has some knowledge of European forests, and who, as Secretary of the Interior, has been in a position to gain special information as to the wanton waste of the timber on our public domain.

The movement to preserve the celebrated prehistoric ruin of Casa Grande, in Arizona, deserves to succeed, and as there appear to be no antagonistic interests, it ought to be an easy matter to secure the requisite Congressional action. Fortunately, the structure stands on a "school section," and the territory of Arizona could be compensated by the cession of another section of the public land. Casa Grande stands in the midst of a region that was extensively cultivated under irrigation by the ancient inhabitants, and, after centuries of fallowness, it is now coming under cultivation again by similar means through modern enterprise. It is a rich soil, well adapted to semi-tropical horticulture, and the preservation of this ancient monument will add to the attractiveness of the section. The movement to save Casa Grande originated with Mrs. Mary Hemenway, of Boston, to whose public spirit science and philanthropy are already deeply indebted.

The Terrace Garden at Wellesley.

THE Terrace Garden at Wellesley, Massachusetts, which is shown in the illustration on p. 103, is by far the finest example of an "Italian garden" with clipped trees and hedges that exists in America. Indeed, so far as we know, it is the only important example of this style to be found here. In the year 1851, we may read in Downing's "Landscape Gardening," Mr. H. H. Hunnewell, of Boston, selected a portion of an old family estate of many hundred acres on the bank of Wellesley Lake, and laid out a country place of some two hundred acres, about forty of which were devoted to ornamental grounds in the vicinity of the house. These forty acres consisted of a "flat, sandy, arid plain which . . . was more or less covered with a tangled growth of dwarf Pitch Pine, Scrub Oak and Birch, all of which were cut down and plowed up." The ground was then prepared for planting, a nursery was established for which the stock was chiefly imported from England, and the place quickly assumed a cultivated and promising aspect. "The house . . . was then built, having . . . on one side a fine extent of simple and dignified lawn, and on the other a French parterre or architectural garden with fountains, bordered by heavy balustrades, surmounted at intervals by vases, with steps leading through a series of terraces to the lake, a fine sheet of water of about a mile in extent having a peculiarly varied and beautiful outline. From this French parterre stretches off on the right the ornamental or English pleasure-grounds, a part of the same view. . . . From this we pass along the lake to the Italian garden. . . . To Mr. Hunnewell we believe is due the merit of having first attempted to clip our White Pine, and the result shows that it bears the shears quite as well as the Hemlock or Yew; though in this garden are equally successful specimens of clipped Norway Spruces, Balsam Firs, Arbor Vitæ, the English Maple, the Beech, and Scotch Firs. From the Italian garden we cross the avenue into a wood through which winds a walk, planted on either side with a very extensive and satisfactory pinetum, containing all the rarest and newest Conifers and evergreen shrubs, which, with the slightest protection from the winter's sun, seem to thrive exceedingly well. Among other features of this place . . . are various vistas through different avenues planted for this purpose—some of Purple Beech, others of White Pine—all of which will in a few years become very interesting and effective."

The editor of the second edition of Mr. Downing's works wrote thus in 1858, when the place had been in hand but seven years. Its success was already so well established and its beauty so great that he could take it as his text for declaring that "if two places of the same size were commenced the same day by persons of equal taste, knowledge and means, one a wood and the other a naked plain, at the end of ten years the naked plain would be the finer and more satisfactory."

Although his description dates from thirty years ago, it might be couched in the same words, though with increased emphasis, were it penned to-day. During the intervening years Wellesley has remained in Mr. Hunnewell's hands, and his reputation among American horticulturists is so wide-spread that there is no necessity here to explain that the place has constantly received the most loving and skillful attention. It is indeed a wonderful place to have been wholly created in less than forty years, and no stronger evidence of its owner's devotion to it could be cited than the way in which the Italian garden has flourished. Perfect results are absolutely necessary if topiary works are to be anything but ragged and hideous deformities. To fail to produce absolutely symmetrical, full and luxuriant forms is to spoil the trees that Nature had designed, and leave nothing but ruins in their stead. But at Wellesley there are no failures and no ruins. A great variety is shown in the formal shapes as well as in the species of trees selected; but in each case the form has been admirably attained, and the species has been made absolutely docile beneath the shears. It is hard to say which tree gives the best result, clipped thus to a smooth wall of green; but the White Pine, most interesting from its novelty in such a shape, is, perhaps, paramount also in soft delicacy and beauty of surface. This, in its natural estate the most picturesque of our native trees, seems the tenderest and most charming when it assumes the form of a solid mass of foliage. The hedge to the left of the foreground in our picture is of Hemlock, while the White Pine shows in the dark tree, cut into three stages, near its extremity. The hedge with the conical masses rising from it that leads away from the centre of the foreground is of English Beech; another White Pine, again cut into several stages, shows near the broad walk by the lake, and the slender pyramidal trees on the second terrace are Norway Spruces. Admirable results, strange as it may seem, have been obtained by clipping the European Larch, which had not before been used in this way. In early spring the compact masses of pale, tender green of this tree are particularly charming. The immediate vicinity of the lake and the classic shape of the boat-house give somewhat the illusion of a real Italian scene, and its effect as one comes upon it in the midst of characteristic New England scenery is very striking. Whether it is an entirely harmonious effect—whether such a garden is a thing to be desired in a rural situation in America—is a question that may be left to individual tastes to decide. Such gardens certainly should not be used everywhere or very often; but those

who have seen Mr. Hunnewell's garden must be glad that one exists in this country. To hundreds of visitors it must have given their first and only sight of the "topiary work" about which they had read so much in books of travel and description, and the man whose skill, patience and taste have supplied his country with a unique work of art is a real benefactor.

The pinetum of which so much was expected thirty years ago, has more than fulfilled all that was hoped of it. It is now by far the most interesting collection of Coniferous trees cultivated in America. The sandy subsoil is admirably suited to the growth of these trees, which have flourished wonderfully under Mr. Hunnewell's generous treatment. The collection is interesting on account of the large number of fine specimens which it contains, and, more especially, for the lessons about trees which it has taught those persons who have been privileged to watch its development. Where trees are concerned, a record of failure is not less valuable than one of success.

The collection contains many specimens of great beauty and interest. Some of the finest and the largest specimens of the Douglas Fir, raised from seed collected by Dr. Parry in Colorado, may be seen at Wellesley. There are fine specimens of *Abies concolor*, *Picea polita*, *Abies Nordmanniana*, *Picea orientalis*, *Abies brachyphylla*, *Abies Veitchii*, *A. Cilicica* (a tree too rarely seen in our gardens), *Picea Aganensis* (the *P. Alcockiana* of most gardens—a tree, by the way, which Mr. Hunnewell considers one of the most promising of all Conifers), *Thuja Japonica*, *Pseudolarix*, and, indeed, every Conifer which has been found capable of supporting the New England climate.

It is pleasant to know that the members of Mr. Hunnewell's family have built themselves country homes in the vicinity of his own, and that so long as the course of nature permits the witnesses to his life-long love of horticulture to survive, the hands of his descendants will give them fostering and loving care.

Sweet Cassava in Florida.

OF recent additions to the food plants of this country perhaps none deserves as much notice as the Sweet Cassava (*Manihot Aipi*). It seems to have been proved beyond question that on the southern border of the United States there are considerable areas admirably adapted to growing this remarkable plant as a staple article of home consumption, while in Florida, at least, its manufacture into starch, tapioca and glucose ought to become a leading industry. A considerable crop was grown in that state in 1885, and parties were about to engage in its manufacture, when a phenomenal frost destroyed nearly all the seed in the state. Such a reverse can be easily guarded against, however, and the fear of its recurrence will not deter any one from planting Cassava according to his ability or inclination.

In the winter of 1887–88 only a few persons in Florida had any seed for planting. Through the efforts of one of the agricultural journals of the state this seed was widely distributed and great interest aroused in the new crop. This winter Cassava-seed is advertised extensively, and it is probable that a large quantity will be planted and that the manufacture of it will be undertaken before the end of the year. An analysis of the Florida root made by Professor Wiley, of the Department of Agriculture, shows it to contain seventy-two per cent. of starch, while Bolivian Cassava has only a fraction over fourteen per cent. of starch. Professor Wiley thinks that good Cassava starch can be made in this country, and that the manufacture of glucose from Cassava will prove even more profitable.

It may here be remarked that the name Cassava is said to belong properly to the product of the *Manihot* rather than to the plant itself, but in the latter sense it has become too well established in this country to be set aside. In tropical America the plant is known as *Manioc* or *Mandioc*. It should be observed, however, that the plant there cultivated almost exclusively, and from which the tapioca of commerce is derived, is the *Manihot utilissima*. This plant, though very similar in botanical characters to *M. Aipi*, has some very obvious differences. Its roots contain a poisonous principle, which, however, is dissipated partially on being grated, and entirely by the heat employed in converting the starch into tapioca. Its roots are of uniform texture, and do not boil soft, while those of the Sweet Cassava do boil soft except as to an axial bundle of tough fibres.

A small quantity of Florida Cassava-seed was obtained by a few Louisiana farmers last spring, and those who have reported results express themselves as highly satisfied. But we must look to Florida growers of Cassava for that extended experience with the crop which is necessary to a correct knowledge of its requirements and profitableness. In the southern portion of the state certain contributors to the agricultural press have had this plant under observation for many years, and to their efforts is mainly due the awakening of interest in this crop.

The Cassava plant is closely related to the Ricinus or Castor Bean, which it resembles in general appearance. It is a handsomer plant, not having the coarse, rank aspect of Ricinus. It does not bear much seed, and it is not propagated from seed, but from cuttings of the larger stems, very much as Sugar-cane is propagated. It is a tuberous-rooted perennial, and though the top is killed by a moderate frost, if the stems are cut so as to leave a few eyes at the base (there are no eyes on the tubers), and these are protected by a light mulching or covering of earth, the top will be renewed each successive year. In south Florida the top has been known to remain green for three consecutive seasons.

Before it is time for frost the stems that are half an inch or more in thickness should be cut, laid in piles and covered with earth. It is said, also, that the stems may be kept where they will become quite dry without having their vitality impaired. When ready for planting, in January, February or March, the stems are cut in pieces about six inches long. These are planted four or five feet apart and three or four inches deep. The crop receives shallow culture till sufficiently grown to shade the ground and hold its own against weeds. It may be left to grow for two years with advantage, thus requiring a minimum amount of culture. The roots should be dug only as wanted for use, as they decay soon after being exposed to the air. Cassava requires mellow, well drained land, and responds readily to manuring. Florida's sand hills seem to be specially adapted to this crop, better, perhaps, than to any other.

As to the quantity of Cassava root that may be obtained from an acre of ground, no satisfactory estimates have as yet been made. It must vary greatly under various conditions. A single plant grown in Polk County produced fifty pounds of roots, the top measuring eight feet in height and ten feet in breadth. It had been highly manured. A person who has given special attention to the Cassava thinks that from ten to fifty tons of roots of one year's growth ought to be obtained from an acre of land, according to its quality. This is little better than conjecture, but certainly the plant yields enormously under favorable conditions.

The uses to which Cassava may be put are almost too numerous to mention. By manufacture it may be converted, with scarcely any waste, into starch, tapioca and glucose, and into substances of minor importance. If it will furnish a substitute for wheat flour, that should head the list of its uses in a region where wheat will not grow. Professor Wiley thinks it is too deficient in nitrogen to serve that purpose, and that it should rank in nutritive value with the Irish Potato. Probably it may best be used in combination with flour and meal. In the Tropics Cassava flour is used extensively for making a large wafer or cracker, which is quite palatable, and keeps without injury for months. Florida housewives have used it for making bread, puddings, custards, fritters, jellies, etc.; also as a vegetable it is used in all ways in which Irish potatoes are used.

It is as food for stock, however, that Cassava has excited most interest in Florida. It is greatly relished by cattle, horses, hogs and poultry, and seems to be a very wholesome article of food. The great tubers, sometimes three or four feet in length, may be taken from the ground at any time of the year and used as food for man or beast. It will thus be seen that the acquisition of Cassava promises to be a great boon to the people of the extreme south, while its manufacture should supply the place of at least one importation—that of tapioca.

Jacksonville, Fla. *A. H. Curtiss.*

"It is in this way that the artist-painter modifies his picture (a picture so much simpler than the artist-gardener's), making this part prettier or more like nature, correcting a shadow here, putting emphasis there,—how then should the landscape gardener, who must work with such refractory and uncertain materials and bring unity out of a whole collection of pictures, hope to succeed at the first attempt!" *Pückler Muskau.*

Foreign Correspondence.

London Letter.

"A SCHOOL of scientific and practical horticulture" is the most important item in the programme of our Royal Horticultural Society for this year. Chiswick is to be devoted to experimental and test gardening, and is to be made ornamental as well as useful. If the Society can succeed in carrying through all that is aimed at in the Chiswick gardens, every one interested in horticulture will be gratified. There is a strong section of the Society in favor of departing entirely from Westminster to Chiswick, arguing that a horticultural society should appeal for support, not through flower-shows and city offices, but through solid work in the laboratory, *i. e.*, the garden. American readers will be interested to hear that in future first-class certificates will not be awarded by the Royal Horticultural Society to plants that are not of exceptional merit as garden-plants. A second-class certificate, called an award of merit, will be given to plants worthy of commendation. After all, the value of these certificates depends on the discriminative knowledge of those who award them, and the committees appointed being composed of leading horticulturists, both professional and amateur, we may feel confident that none but first-class plants will win their approval. It is also intended to certificate strains and not individual plants in such cases as seedling Begonias, Fuchsias, Primulas, etc. A healthy sign is noted in the desire shown by nurserymen and others to get certificates for their new plants. Many of the nurserymen who used to hold aloof from the Society now submit their new plants for its approval.

At the meeting held on the 15th inst. the following plants were exhibited and received first-class certificates: *Vanda Amesiana*, to which I have recently referred. Messrs. Low & Co., who introduced it, state that their collector saw plants with over 100 expanded flowers, and one upon which no less that 185 flowers were counted. The species is very distinct, and bears evidences of proving a most useful garden Orchid. *Primula Sinensis*, Swanley Mauve, is remarkable for the size and substance of its pale, mauve flowers; some of those shown measuring more than two inches across. Mr. Cannell has succeeded in obtaining a strain of Primulas remarkable for vigor and size of flower. He and the Messrs. Sutton have been most successful in Primula breeding. Some interesting information, both historical and cultural, on *P. sinensis* has recently been collected and published by Dr. Masters, in the *Gardeners' Chronicle*. The power of the plant-breeder when relying solely upon seminal variation is well exemplified in the success with this Primrose. The prototype is a poor plant, with flowers smaller than those of *P. poculiformis* or *P. obconica*, and correspondingly small foliage. Mr. Cannell's Swanley Mauve is only one of thousands of forms which have been the outcome of cultivation and selection on the part of the horticulturist. I do not think the importance of looking after seminal variation under cultivation is properly grasped as yet by horticulturists generally, yet it is a fact that better results are thus obtained than by hybridizing alone.

Mr. Frank A. Morgan, whose article in the *Nineteenth Century* on "Fruit-growing" you recently referred to, is not considered an authority by English professional men. Mr. Morgan gauges the whole question by his experience in a fruit-market, and quotes fancy prices paid by a few extravagant cockneys as a basis upon which to argue the question of fruit-growing for the whole of England. Mr. W. N. White, who has had twenty years' experience in the London Fruit and Vegetable Market, and is a grower as well, says: "I have, at the present time in my warehouse, apples from Herefordshire which cannot be sold at a shilling per bushel; I have also apples from Berkshire and Oxfordshire which cannot be sold at two shillings and sixpence per bushel, and yet a fortnight ago, I sold American apples as high as eighteen shillings per bushel, though I think it only fair to say that plenty of American apples are being sold at three shillings per bushel, and that during the past month of December I have received no less than 16,500 barrels, representing 50,000 bushels of apples from America. Some of your correspondents will say that this proves their contention that these can be grown in England. Permit me to inform them that they could not be grown in England, and that the worst apple I am at present receiving from America is superior to the best of any I am getting from the home country." Testimony from growers of great experience all tends to prove that fruit-growing in England is a poor panacea for agricultural distress. Mr. Morgan has urged, in a leading society journal, that we have only to plant the fields with fruit-trees, and engage a few laborers to look after them, to ensure an abundant supply of such fruit as shall beat the foreign produce out of the English market!

Bamboos.—The two beautiful illustrations of Bamboos in Ceylon, which appeared in your issue of the 9th instant, would have delighted General Munro, who paid considerable attention to the cultivated Bamboos at Kew, where a large collection of both hardy and tropical species is grown. In the Palm house we have a clump of *B. gigantea* (*Dendrocalamus giganteus*) and another of *B. vulgaris*, with canes sixty feet high and five inches in diameter. In the gardens of the Duke of Northumberland at Sion House, situated on the Thames, just opposite Kew, is an equally large specimen of *D. Brandisii*. The quick growth of these canes—eighteen inches in a day—is most interesting; the shedding of the beautiful sheaths from the newly-developed cane, so well shown in your figure 85, being suggestive of the hatching of eggs. None of these giants have been known to flower here. The pretty *Arundinaria falcata* is cultivated for the decoration of rooms, some of our principal plant-furnishers growing it by the hundred solely for this purpose.

Grown in nine-inch pots the canes attain a length of six feet to eight feet, branch freely towards the top, arch over in the most graceful and plume-like fashion, and, being clothed with soft green, lance-shaped foliage, they form most useful decorative plants for large halls. When they get shabby all that is required is liberal treatment in a hot, moist stove for a few weeks, and they are as good as ever. Apparently the hardy Bamboos are little known with you, probably because your winters are too cold. Here *B. Metake* is a grand mass twelve feet high and as much through, the foliage of the richest green, and the habit as graceful as a fern. It is outside in a moist, shaded corner, and receives no protection whatever. *B. mitis* is another graceful, hardy kind; so, too, is *B. nigra*, *B. viride-glaucescens*, *B. hybrida*, *B. Simonii*, and about half a score of others under garden names. These get no protection, and are beautiful all through the winter. They like moisture and plenty of rich manure. M. Latour Marliac, a French nurseryman, has lately introduced a number of beautiful kinds of reputed hardiness, some of which have variegated foliage, or striped canes. The singular square-stemmed Bamboo (*B. quadrangulata*) is also quite hardy at Kew.

Herbaceous Pæonies have suddenly sprung into favor here. Nurserymen are collecting and propagating them, and amateurs are inquiring into the merits of the many kinds offered. Except in the old-fashioned country gardens these plants were scarcely to be met with until lately. They are big, rich in colors, artistic enough to please the æsthete, and as easily kept as weeds. Not a little of their beauty is in their foliage in spring, which, as it pushes up, unfolds to view the richest of coppery and bronze colors. I know one famous garden where the proprietor prefers the foliage to the flowers, planting his Pæonies for spring effect. If we could grow the Montans no doubt many would prefer them, but they thrive in comparatively few localities in England. At Kew, for instance, they lose more growth in winter than they make during summer.

W. Watson.

Kew.

New or Little Known Plants.

Japanese Chrysanthemum—Medusa.

EVERY one who has raised many Chrysanthemums from seed has occasionally found flowers with drooping florets, and such plants are rare in collections chiefly because they have not been considered worth propagating. As long ago as 1816 a Chrysanthemum, with long, white, streaming florets was described in England by Sabine. Delaux has sent out one or two varieties of this form, although of different colors, but they did not prove to be favorites with the public and they no longer appear on his lists. The plants which produce this type of flower have not generally been of vigorous growth, and have not proved capable of much improvement. The one illustrated on page 101 came to this country from Japan, where some of the tasseled forms are said to be much admired in the Neesima Collection, which included the Mrs. Alpheus Hardy and other noteworthy varieties. It is better than any of this class which we have seen—pure white in color, and, as the illustration shows, not without a certain grace of form. It is certainly interesting as a curiosity, and it may be found of use as a parent of new forms when crossed with other varieties.

Cultural Department.

Green-house Plants—I. Correas.

THE genus Correa is composed of about half a dozen very variable species, all natives of Australia, where they are known among the colonists as "Native Fuchsias." They belong to the order *Rutaceæ*, and are nearly related to Boronia, Crowea and Eriostemon. They form compact shrubs, usually about six feet high, though at least one has been seen as high as thirty feet. Under cultivation, however, they rarely exceed a yard in height. All the known species have been in cultivation in England, where, from about 1820 until a few years ago, the Correas, along with many other Australian plants, were among the most popular of green-house flowering plants. Several reputed hybrid Correas were raised in England, and numerous varieties were known, so that at least a score of named kinds may be found mentioned in old lists. For garden purposes it will be most convenient to call the kinds by the names under which they are grown, as it is somewhat difficult to understand why botanists refer *C. cardinalis*, *C. Backhousiana* and *C. pulchella* to *C. speciosa*, the plants known in gardens under these names being abundantly distinct.

Correas are among the most beautiful of hard-wooded green-house plants. They are easily managed, form nice shapely bushes and blossom freely every spring, often continuing in flower till midsummer. They are rarely seen in modern collections, having been crowded out by quicker growing and more gaudy-colored plants. A beginner often fails with them through treating them as if they were Fuchsias or Pelargoniums, and, growing disgusted with their behavior, discards them as worthless. And yet a well-grown Correa when in full flower is a perfect picture of elegance.

Fig. 97.—Japanese Chrysanthemum—Medusa.—See page 100.

When propagated by cuttings these should be about three inches long, and composed of ripened wood of the last year's growth. They should be planted in very sandy peat and placed in a close frame, where the temperature is about 65°. Here they ought to be rooted in about two months. Grafting is, however, the most common method, as good plants are obtained more quickly, and the weaker kinds thrive better when grafted on a strong-growing stock than when on their own roots. *C. alba* forms the best stock for all the kinds except *C. cardinalis*, which should be grafted on a sturdy variety of *C. speciosa*. The stocks should be young, and the grafts similar to the pieces preferred for cuttings. Side grafting, close to the base of the stock, and allowing the top to remain, always proves successful. February is the most favorable time for this operation. The worked plants should be placed in a close frame where the temperature is about 60°, and if looked after they will be united in about six weeks. The top of the stock may then be pinched out, leaving the lower part till after the cion has made a little growth. The young plants should be grown in an intermediate and somewhat close temperature, and kept bushy by pinching out the tops of the strongest shoots. In winter a temperature of not lower than 45° at night should be maintained. In April the plants should be re-potted in a mixture of peat two parts, leaf-mould one part, and a good addition of silver sand. The soil should be pressed in firmly. During summer a sprinkling of water overhead should be given twice daily. Some of the kinds branch freely and keep compact in habit, whilst others must be frequently stopped to prevent them from becoming leggy. The plants require sufficient water to keep the soil moist, without its ever becoming saturated. They like plenty of sunlight, shading only for an hour or two at midday during summer. As the plants get larger a shift into a larger pot every two years or so will be sufficient. By judiciously staking the young plants, handsome bushy specimens can be grown in about four years. Of course the plants flower freely and regularly every year from the first. Small specimens in four-inch pots make pretty table plants. The flowers are useful for cutting, and last several days in water. The robust growing kinds such as *C. alba*, *C. Lawrenciana*, *C. Backhousiana* and *C. speciosa* will thrive well when planted in a bed in a sunny position in an ordinary conservatory. Large examples of these kinds have been grown by treating them in this way at Kew. They bear cutting back heavily without suffering; this treatment is recommended for leggy or unshapely specimens.

The following are the best of the cultivated kinds:

C. cardinalis; introduced by Veitch in 1856. It has an erect, somewhat thin habit, the branches dark brown and shining when old, tomentose when young. The leaves are one and a half inches long, half an inch broad, recurved at the edges, dark green above, pale and wooly on the underside. Flowers drooping on the ends of the numerous small branches, one and a half inches long, tubular, bright scarlet, with segments reflexed, greenish yellow; anthers exserted, yellow.

C. speciosa-major; introduced in the last century. An erect, bushy species, covered with a rusty tomentum, branching freely, and crowded with oblong leaves one inch long.

Flowers on short axillary branches, tubular, one and a quarter inches long, erect or drooping; color, deep crimson, with bright green on the scarcely reflexed segments. An easily grown and handsome plant, the best forms of it almost equaling *C. cardinalis*.

C. ventricosa; very similar to the last mentioned, the only difference being in the form of the flowers, and which is described by the name.

C. pulchella; introduced by Low in 1824. It forms a compact shrub, about two feet high, freely branched, crowded with cordate-ovate leaves one inch long, which are wooly when young, smooth and dark green when old. The flowers are pendent, tubular, one and a half inches long, the segments spreading; color uniform, bright rosy red, calyx green, stamens exserted, yellow.

C. magnifica; a compact, much-branched shrub, about two feet high, with orticular leaves, every part covered with a brown tomentum. Flowers not always drooping, tubular, one and a quarter inches long, white, covered with minute stellate clusters of scale-like hairs. This is probably of garden origin, the result of a cross between *C. alba* and some other species.

C. Laurenciana; the largest grower of all. The type is not particularly handsome, having leathery leaves, one and a half to two inches long, smooth, shining above, tomentose beneath; flowers in pairs or threes on the ends of short branches, greenish. It attains a height of thirty feet in Australia. A large red-flowered variety of this has been discovered in Australia by Baron von Mueller, but although frequent attempts have been made to introduce it, this evidently magnificent shrub remains still unknown in gardens. Seeds of it do not appear to be obtainable.

Other species are *C. alba*, which has small greenish-white flowers, and is grown principally as a stock for grafting the weaker kinds upon; *C. æmula*, with orbicular leaves and purplish flowers, sometimes met with in gardens under the name of *C. Colvillei; C. Backhousiana*, with ovate, thick, felt-like leaves, and tubular, yellowish green flowers; *C. longiflora*, very likely a form of *C. speciosa; C. Brilliant*, of garden origin, with long tubular flowers, and *C. Harrisii*, a hybrid of inferior merit. Those here described at length are really beautiful and useful plants for the green-house, where they flower from December to April, and even longer. *W. Watson.*

Kew.

Roses.

Shallow Benches or Solid Beds for forcing Roses.—The question, Which possesses most advantages for Rose forcing, solid beds or shallow benches raised up from the ground, is still discussed among growers; and each plan has earnest advocates.

That both systems have advantages, under different conditions, has been frequently proved, but how to decide which method is the better adapted to particular circumstances has been a knotty question with many cultivators.

It has been stated in favor of the bench system that the condition of the roots was under better control, and that in consequence the plants were not likely to take so long a rest between crops, and the output was thereby increased, and also that there was less risk of over-watering.

Of course, it is quite natural that the evaporation will be much more rapid from a bench containing from three to four inches of soil than from a solid bed on the ground level. This is a strong point in favor of the bench system. Another advantage will be found by cultivators whose places are situated in large cities in the saving of soil by this method, this being a point of much importance where the supply of good soil within easy reach is limited, as frequently happens in such cases. And in any case there is much less labor to be performed in the preparation of the benches than in that of the solid beds. But there are other things to be considered. Prominent among them is the fact that many of the Roses used for forcing produced better flowers the second year than the first, as, for instance, Catherine Mermet, The Bride and Bon Silene, and it is undoubtedly easier to keep these plants in good condition during the summer months, when they are planted out in a solid bed than when they are planted on a bench exposed on all sides to the air, and liable to be heated all through by the sun to a much greater degree than is necessary for the welfare of the Roses.

It seems, therefore, that it would be wiser to adopt an intermediate practice rather than to condemn either system entirely, and use the bench plan for those varieties most sensitive at the roots, as Niphetos, Papa Gontier, Duke of Connaught and others of similar characteristics, and the solid-bed method for the stronger-growing more permanent sorts.

But the solid beds would often produce a better result if more care were given to their preparation, especially in regard to drainage, as a bed placed directly on a hard sub-soil is almost certain to become too wet during the winter.

A better practice is to make the total depth of the bed from fifteen to eighteen inches, all of which should be above the level of the ground, and to prepare it as follows, with such modifications as the circumstances may require:

Fill in the bottom of the bed to a depth of eight or ten inches with broken bricks, stones, clinkers or coarse cinders, and on this place a layer of good sod, grass side down, after which the bed may be filled up with the usual mixture of soil and fertilizers. A bed prepared on this principle will usually keep in good condition for several seasons, and may be refilled with soil without disturbing the drainage. And in the construction and preparation of benches for a similar purpose, due regard should also be had to drainage, as it will be found that a little care in this respect will be well repaid.

A good way to accomplish this is by building the bench of lumber six inches in width, with a space of from half an inch to an inch between the boards, as these spaces are readily covered by using the rougher soil in the bottom of the bench, thus forming a ready means of egress for the water.

Chestnut lumber will be found to last the longest for benching, but as this is not easily procured in all localities, it is not very often seen in use for this purpose, though where it has been thoroughly tested the report is usually favorable. *W.*

Shrubby Begonias.

THE great variety now to be found in Begonias has placed them in the front rank as decorative plants. Growing as they do without coaxing of any kind, always bright and cheerful in appearance, handsome either in foliage or flower, or both, they deserve a wider appreciation than is now accorded them.

In the spring of last year I made a selection of the best kinds, including many of the new French hybrids, and for the past two months, or since Chrysanthemums are out of bloom, they have been truly beautiful. They were treated as follows: Small plants in two-inch pots (two of each variety) were re-potted into four-inch pots about the middle of April last, and kept in a partially shaded green-house, without fire heat, until the end of May. They were then shifted into six-inch pots and the points of the shoots were pinched out so as to make them bushy. The soil used was a rich sandy loam of light texture. A few days afterwards they were placed out-of-doors in a shady place having a north-west exposure, watered as required, and finally shifted into eight-inch pots at the end of August, and removed to the green-house where they are to-day. The night temperature has been kept at an average of 55°. An occasional watering with liquid manure has been given, which helps materially to keep up a uniform growth. Several of the plants are now covered with bloom, while others have long scapes of brilliant coloring standing boldly out from the foliage. Some of the most striking kinds are to be found in the list which follows:

B. Gloire de Sceaux.—Bushy habit, with medium-sized, deep purple-bronzed leaves of a most exquisite shade; the flowers, literally covering the plant, are of a lovely peach-pink color.

B. Rubra (coccinea).—A very old species, with richest coral-scarlet flowers, flowering freely as small plants, but at its best when grown into large plants.

B. Incarnata. (Insigne).—Flowers large, deep flesh pink, plant bushy and very showy.

B. Diadema.—A distinct species, having palm-shaped leaves of bright sea-green, marbled with olive-green and spotted with white; flowers white.

B. Alba picta.—A little gem, having narrow lanceolate leaves, dotted all over with white spots. The flowers are greenish white, shaded with bronze, in panicles from the under side of plant.

B. Olbia.—Olive-green, metallic shaded leaves peculiarly formed and disposed, flowers very large, greenish-white, produced from the axils of the leaves on the main stem; an effective kind.

B. semperflorens rubra.—Bright, shining green foliage, with large panicles of carmine-red flowers. Another variety of semperflorens, Amelia, has larger and brighter flowers.

B. discolor, Madam Lennet.—Leaves olive-green, marbled with gray-white, flowers large, deep pink.

B. discolor, M. Hardy.—Leaves deep reddish-bronze, marked with white, flowers rose.

B. PRESIDENT BONNEVILLE.—Leaves marbled silver, on bronzy shaded ground, flowers silvery pink, very handsome.

B. Manicata aurea.—One of the oldest species, with distinctly mottled yellow and green leaves; a very effective and beautiful plant.

Pearl River, N. Y. *John Thorpe.*

Orchid Notes.

Stauritis (Vanda) *gigantea.*—As its name implies, this Orchid is of giant growth and noble appearance, but is only suitable for large houses. It is not by any means as attractive as *S. Batemanni.* The stout stem is closely clasped by dark green leaves about two feet long, tough and fleshy. The axillary racemes are very stout, pendulous, and bear twelve to eighteen thick, fleshy flowers, about three inches across, of deep yellow, blotched and spotted with reddish crimson. The small lip is incurved and channeled. This plant was introduced, thirty years ago, from Burmah, but it rarely blooms, though now it flowers here every year. It did not do so until it was nearly three feet high. It requires strong heat and abundance of water during growth.

Angræcum citratum is a choice and attractive little Orchid, and the freest bloomer of the genus. It is dwarf and compact, with oblong, lanceolate, dark-green leaves, from the axils of which spring the slender, pendulous racemes, sometimes two feet long, closely set with pale, yellowish-white flowers in two rows. Sometimes as many as fifty flowers are on a raceme, and when four or five of these are borne on one plant it forms a very charming object, which remains in full beauty a long time. This plant was introduced, about twenty years ago, from Madagascar, and should be grown in moss and chopped leaves—in baskets—placed in the warmest house with a good supply of water, and should at no time be dry.

Lycaste (*Colax*) *jugosa* is an attractive little plant, with ovate, pointed bulbs and lanceolate, acuminate leaves. The erect

The Terrace Garden at Wellesley.—See page 98.

Phajus maculatus is a showy Orchid of strong growth, making a fine decorative plant, but of little use for cutting, as the flowers are as easily damaged as those of a Camellia. It forms large, ovate bulbs, terminated with ovate, lanceolate, plicate leaves nearly three feet long, dark green, copiously spotted with yellow. The scapes—generally two—are about two feet long, and bear fifteen to twenty bright yellow, fleshy flowers. The lip is streaked with reddish-brown, the middle lobe much crenated and margined with the same color. This plant is not seen as often as its merits deserve. It grows very freely in ordinary stove-plant soil, with the usual treatment of these plants. But when growth is finished it should be kept in a comparatively cool house. The variety Intermedia differs from the type only in the foliage, which is devoid of variegation.

Oncidium Cavendishianum.—An extremely useful species, lasting a long time in perfection, and especially useful for cutting. It belongs to the bulbless section, with thick, fleshy leaves, which are broad and about a foot long. From the base of the leaves springs the strong panicle, three to four feet long, bearing numerous bright yellow flowers of good size. The sepals and petals are wavy and specked with red. It is a native of Guatemala, and requires the temperature of the intermediate house, with very little potting material, which may consist of lumps of charcoal and a little moss. It should be kept moderately dry during the winter.

scape appears with the young growth, and bears three to four very handsome flowers, with sepals and petals of a creamy white—the latter barred and blotched with chocolate-purple. The small lip is of velvety texture; white, streaked and dotted with dark purple. It is a native of Brazil, and grows best with us in the warmest house, with copious supplies of water, and potted in peat and moss. Thrips are very troublesome to this plant, and a sure preventive is always to water overhead.

Kenwood, N. Y. *F. Goldring.*

Epidendrum Endresii is one of the prettiest of dwarf-growing species but is now rarely seen. It is remarkable for its free flowering and lasting qualities, remaining fully eight weeks in good condition on the plant. The flowers of a well-grown plant are most beautiful, their snow-white sepals and petals contrasting agreeably with the lip, which is blotched with violet. In Mr. Wallace's collection at Paterson, New Jersey, a strong plant in fine health is now flowering, having a number of spikes covered with blossoms from the apex of thin grass-like stems. It is a native of Costa Rica, and thrives at an altitude of 6,000 to 8,000 feet, where it is cool at all seasons.

Many attempts have been made to import this plant in quantity, but every consignment, no matter how it may be packed, is almost worthless on its arrival, and very few plants survive the close and impure atmosphere to which they are subjected on their passage to this country. This Orchid will, in all probability, therefore, remain a rare plant for years to come. It grows very freely at the coolest end of the Cattleya-house in a shady situation, and should occupy a basket or pan suspended as near the light as possible, in a mixture of clear sphagnum and rough, fibrous peat, with ample drainage. In full sunlight its thin, fleshy stems will soon become weak and perish.

Summit, N. J. *A. Dimmock.*

Some Choice Narcissus.—The beautiful little *N. Cyclamineas* has proved to be of easy culture. Collected bulbs flowering with us for the second season, show a marked improvement, both in size and quantity of bloom. Let us hope that this little gem, after having been lost to cultivation for more than 250 years, has come at last to stay. *N. triandrus*, from Portugal, is now opening in abundance its pretty, pale, pendent flowers. This is often considered hard to keep, but thrives well here under the treatment given to others of its class in a soil two parts loam to one of peat. The varieties of *N. Bulbocodium* give a display for several months, commencing with var. *monophyllus*, which is white and of the characteristic "Hoop Petticoat" form. Var. *citrinus* comes next, with pale yellow flowers, which are just now at their best. *N. Bulbocodium* is the last in order of flowering, and comes a month later. We have also a form of *N. Bulbocodium* from Portugal which is quite distinct, no two bulbs producing flowers alike, but differing principally in the cut-off appearance of the corona. To the above may be added *N. serotinus* and *N. juncæfolius*, making an interesting collection for those who have small space at their disposal. All the above-named do well in five-inch pots at a temperature of 50° to 55°.

Passaic, N. J. *E. O. Orpet.*

Principles of Physiological Botany as Applied to Horticulture and Forestry.

IX. Changes of Organic Matter Within the Plant (Continued).

WE have already seen that the first product of assimilation proper, that process by which the plant converts inorganic materials under certain conditions into organic matter, is probably some form of sugar. In the last paper it was pointed out that this primary substance bears peculiar relations to starch, the first visible solid product of assimilation. We are now to examine the physiological relations of the group to which sugar belongs and see in what way this is utilized by the plant as food.

There are three chief groups of sugars found in plants. They differ from each other in the proportions of hydrogen and oxygen which they contain, and they possess somewhat different physical properties. They are known as (1) the directly fermentable, (2) the indirectly fermentable, and (3) the non-fermentable; that is, they sustain different relations to certain microscopic organisms by which the process of fermentation is carried on.

The sugars of the first group may be represented by grape sugar, sometimes known as glucose, which occurs to the amount of five to thirty per cent. in certain ripe fruits. It is crystallizable, but lacks the high degree of sweetness which we associate with the type of the second class, namely, cane sugar. This latter is the sugar of the sugar cane, and of the sugar beet, and of sorghum, but it is generally associated with a certain amount of other forms of sugar, and by the very process of extraction a portion of the cane sugar may be more or less completely transformed into the less desirable kinds. The third group is represented by a substance which may be procured from certain Acacias, etc. Sugars of the last group are wholly incapable of ordinary saccharine fermentation; those of the second ferment only after they have become acted on by some agent which partially modifies their original character, while those of the first are very easily, and, as one may say, directly fermentable under almost any conditions. But all of these, like members of the starch series, are capable of undergoing oxidation, giving up thereby a portion of their energy of position, which reappears as energy of motion. The ultimate products of the complete conversion of these substances are carbon dioxide and water, the inorganic materials from which they were first brought together by the agency of the plant under the influence of the sunlight.

It should be borne in mind that the few sugars here mentioned are only representatives of classes, and that these classes by no means exhaust the list. Moreover, it should be remembered that the sugars occur in different amounts in different plants, and, as is the case with many other substances, in different amounts in different parts, and, in the same part, at different periods of its development.

The second great group of substances containing carbon, hydrogen and oxygen, but no nitrogen, is that of the vegetable fats or oils. These are of very complex composition, and do not need to be here commented on from a chemical point of view, further than to take note of the fact that they contain relatively less oxygen than the substances before mentioned.

The fats or oils sustain peculiar relations to the living matter of the plant, especially while the latter is in a state of rest or of suspended activity, as in the case of ripe seeds. It is interesting to observe that the seeds of by far the greater proportion of species contain their food stored up, not in the form of starch, but of oil of some sort. In many cases the oil is capable of drying when exposed to the air, as is the case with that of flax seed (linseed oil), while in others it does not thicken rapidly, if at all. Oils of the first sort are extensively used in ordinary painting. The so-called volatile oils, such as the fragrant oils of the different members of the Mint order, are closely related to the turpentines, and are not to be confounded with members of the group of true fats.

It is a curious fact that in some, if not most, cases thus far observed, the fats or oils of seeds are in part transformed into other carbo-hydrates, such as starch, before they are utilized by the seedling. Thus the seed-leaves of the Castor-bean have been shown to take from the general supply a certain portion of the oil as such, and during conveyal to other parts, or somewhat later, to transform at least some of it into starch, which can be detected in the form of characteristic granules.

The third group of these substances free from nitrogen comprises the vegetable acids, such as Tartaric (in grapes), Malic (in apples), Citric (in lemons), and the like. Most of these are found in different proportions, and are never free from admixture, so that we may find even more than two of these in the same fruit, some of them occurring, perhaps, in mere traces only. One of the vegetable acids most frequently found is Oxalic, which is generally combined with calcium to form crystals of calcium oxalate, abundant in plants. In other cases it unites with potassium. In most instances there is also more or less of this acid remaining uncombined. It is difficult to form a clear conception of the direct use of these acids to the plant, except so far as they play an important part in the protection of the plant or some of its organs, as, for instance, its fruits, from unwelcome guests. This aspect of the subject will be examined at a later period, when we come to glance at the methods of dissemination of seeds.

Among the less important substances, which may be alluded to in connection with those now examined, are various astringent matters; for instance, members of the Tannin group. These occur in almost every part of the plant at some period of its growth. Widely different views have been entertained as to the origin and the probable use by the plant of these substances, some investigators holding that the members of the tannin series are waste matters, while others believe that they are reserve materials. In some cases they seem to have a very plain function in defending the plant from its enemies, but this, which is only a specialized office, will be incidentally referred to later. Associated with the tannin-like bodies are the curious principles which occur in certain barks, such as æsculin, in the bark of the Horse-chestnut, etc.

From the extremely long list of other subtances free from nitrogen, only the following can now be noticed in passing: (1) the ethereal oils, compounds of carbon and hydrogen, and (2) the resinous matters, which are much the same as the last, but are combined with more or less oxygen. Both of these classes of substances are obscure in their origin in the vegetable laboratory, and in most cases it is difficult to hazard any reasonable conjecture as to their work in the plant. Probably they always have or have had some office of attraction (as is clear in the instance of the perfumes of certain flowers), or of defence, as is seen in innumerable cases. But we may possibly get a hint as to their office and occurrence when we remember that during the life of a given species its surroundings must have changed in many ways, and that possibly attractions and modes of defence required at an earlier stage are now no longer useful to the plants under existing conditions. And it is well known that a great many peculiarities of all sorts persist long after the conditions to which they were adapted, or which may have called them forth, have passed away.

In concluding this sketch of the substances free from nitrogen, we are now able to say that they fall naturally into two

classes—those which serve as treasuries of energy and those which subserve some minor but doubtless important end. We turn next to glance at that group of substances in which is found the vehicle of all these activities which present themselves when the energy treasured in the plant is released and manifests itself to us in some other way.

Cambridge, Mass. *George Lincoln Goodale.*

The Forest.

The Forests of Michigan.

The first report of the directors of the State Forestry Commission of Michigan is a remarkably interesting and valuable document. It includes the law establishing the Commission, an account of a forestry convention at Grand Rapids, at which there seems to have been a much larger proportion of practical and sensible talk than is usual at such meetings, a list of trees and shrubs found in Michigan, and a large number of useful illustrations, which show the appearance and habit of growth of some of the principal trees of the state. The most important portions of the report are the brief and admirable discussions by Professor W. J. Beal of such subjects as forest-management in southern Michigan, forest-fires, the succession of forests in northern Michigan, cutting and removing logs for lumber, a lumber-camp, new uses for certain kinds of timber and the amount of pine yet remaining in Michigan.

The law provides for sending questions to the township-supervisors of the state regarding the area of forest-land, the origin and extent of fires and resulting damage, and the need of additional forest-legislation. The answers are not always very important, but the practice of sending out such questions has great value as a means of popular education regarding forestry subjects.

There are interesting communications from Professor A. J. Cook, Eugene Davenport, A. C. Glidden, A. A. Luce, T. T. Lyon (President of the Michigan Horticultural Society), Geo. D. Moore, W. K. Sexton, Professor V. M. Spalding, B. W. Steere, A. S. Kedzie, J. H. Moores, Geo. C. Nevins, and Hon. John T. Rich, Commissioner of Railroads. There is pretty uniform testimony that pasturage destroys the forest. But one gentleman says: "It is customary to pasture timber-lots. I consider it no injury to the trees, and but little benefit to the stock, except in the way of shade." If his judgment is correct, domestic animals might as well be kept out of Michigan woods.

There are several pages of apt quotations from this journal. The officers of the Commission are: Hon. Franklin Wells, President; Hon. Henry G. Reynolds, Secretary; Hon. Wm. B. McCreery, Auditor; Dr. W. J. Beal, of Agricultural College, and Hon. Chas. W. Garfield, Grand Rapids, Directors.

If every public library in the country could have a copy of this report it would vitally aid the work of popular education regarding forestry. An appendix contains the laws of Michigan relating to forests.

We make the following extracts from an address by Col. E. T. Ensign, of Colorado, at the Forestry Congress at Atlanta, last December, on the Colorado Forestry System.

The Colorado State Forestry Association was the first fruit of systematic local agitation of the forestry question. After its organization followed the enactment of a forest law in 1885. It created the office of State Forest Commissioner, and made the County Commissioners and Road Overseers through the state forest-officers for their own districts. The Commissioner has an annual salary, office equipments and traveling allowances. The county officers are paid *per diem* by the counties for services rendered. These officers are charged with the oversight of the public forests, they are to guard them against depredation and the outbreak and spread of fires, and they are to promote the culture of forest trees.

There are penalties for the willful or careless setting of forest fires, and for failure to extinguish camp-fires. The county officers must post notices conspicuously along the highways, warning travelers to put out their camp-fires, and citing penalties for failure to do so. Arboriculture is taught at the State Agricultural College, and provision has been made for the establishment of four experiment stations in different parts of the state. Forest-fires have become less frequent and destructive, and federal officers are aided somewhat to protect the timber on the national domain. Special effort has been made to show the intimate relations between the mountain forests and the streams of the state and its irrigation system. The forestry system of Colorado is an effort to improve local forest conditions. It deals with new methods, and seeks to adapt itself to conditions unlike those existing elsewhere. It should be maintained until a more efficient system can be devised and put in operation.

Correspondence.

Forest Changes in Rhode Island.

To the Editor of GARDEN AND FOREST:

Sir.—When Roger Williams entered the Narragansett country and landed at what is now Providence, he had passed through a Pine and Cedar country. The slopes of the Mosshassuck, of the Blackstone and Seekouk were heavily covered with Pine and Cedar. The stately Pine towered high and spoke to the winds; the Cedars were large and thick. There was Oak, but not in abundance. Now, confining myself to the region north of Providence, for a few miles of which I am familiar in ministerial work, I find that wherever the Pine has been cut down, not the Pine, but the Oak, has appeared. In Lincoln township there is abundance of Oak. Let us suppose ourselves in Pawtucket, a city adjoining Providence; we reach the end of Dexter Street, and for half a mile have woods. Much of it is little, scraggy Oak, in outer appearance like the Oak-forests I have often surveyed in central Illinois. Ascending the hill towards Saylesville, we see rising out of these puny Oaks perhaps twenty tall Pines, isolated and magnificent, and as graceful as any I ever saw. They stand alone like the pillars of the Temple of Jupiter Stator, monuments of a splendid arboreal age, when all those hills and valleys were filled with their brethren. In Saylesville itself, south of the bleacheries, and all alone, stands one of the most perfect and magnificent Pines in Rhode Island, its spreading branches a dark, rich, beautiful green. Above, around the rising hill, is the Oak. Between Saylesville and Pawtucket is a forest, a few tall Pines, but invariably where there has been a cutting is the Oak. Now, why is it that in this section of Rhode Island Oak succeeds Pine? The Pines disappear. Tall and stately, and beautiful and strong, they have no successors. I tremble for that grand, unparalleled tree in Saylesville. It stands unique, and if your widely read journal can induce some Rhode Island photographer to take its picture I shall rejoice. It may be removed at any time from business necessity.

Providence, R. I. *Henry H. Northrop.*

[The changes in the character of the forest-growth noticed by our correspondent in the neighborhood of Providence are gradually going on in many different parts of the country. They represent the bad effects which invariably follow ignorance in the management of the soil, whether it be the rich Corn-land or Cotton-land of the west or south, or the Pine-producing drift of New England. We are paying now, and dearly, for the mistakes made by earlier generations in the treatment of the soil in the first settled parts of the country, and we owe it to ourselves and to the generations which are to follow us, that the same charges are not made against us by our children's children. Land which produces large Pine trees does not produce vigorous or valuable Oaks. If the forests that once covered the gravelly plains and hills which surround Providence had not been disturbed by man; if the trees had not all been cut off and the surface soil licked up by constant burning, they would have been composed principally to-day of large White Pines and Cedars, as they were two hundred years ago. Fire and exposure are fatal to seedling White Pines. It is found that the seed of this tree does not germinate in soil which has recently been burned; and that the seedlings, when the seeds do germinate, perish when they are too much exposed to the sunlight, as is the case when the forest has been entirely cut away. The fact, however, that White Pines germinate freely and grow rapidly on abandoned pastures and old fields in many parts of New England, shows that the changed character of the soil consequent upon burning has more to do with the inability of this tree to reproduce itself upon ground recently cleared of a forest of Pines, than the exposure to light which follows clean cutting. The nature of the Pine and the Oak being understood, it is not difficult to see why, under the methods of forest-mismanagement which exist in this country, the latter is gradually taking the place of the former. An acorn may be carried by animals into the

midst of a Pine forest. It has the power of germinating and of existing almost indefinitely in deep shade. A feeble shoot only, perhaps, appears above the surface, hardly increasing perceptibly from year to year, while below the root goes on extending deeper and deeper. At the end of a century, perhaps, the Pines which shaded the Oak and checked its upward growth are destroyed, either by fire or by the axe. The Oak is broken off close to the ground, or fire consumes what appears above the surface. The Oak, however, has what the Pine does not have—the power to send up shoots from the stump—and the great root, which has been growing for years, at last has the opportunity to assert itself, and send up a strong, stout stem, or a cluster of stems, which occupy the ground, and so change the character of the next forest-crop. It is not probable, however, that there could have been enough Oaks growing in this way in any forest of Pines to change at once its character, and seedling Pines would appear among the Oaks, especially if the ground had not been burned over. But fires, if they do not do the damage the first year, are almost sure to come, sooner or later, and as they destroy the Pines and do not destroy the Oaks (for an Oak can be burned several times without destroying the vitality of the stump), every time a piece of ground is burned over the hold of the Oaks is strengthened as that of the Pines is weakened. This is why land which once grew large and valuable Pines now only produces small, stunted and worthless Oaks. This is what has been going on for a century or more all over New England and everywhere in the White Pine belt of the north. Mismanagement in the south is converting the valuable forests of the Long-leaved Pine into comparatively worthless forests of Old Field Pine. In Kentucky and in Tennessee mismanagement is gradually changing the forests of valuable White Oaks into forests of worthless Black Oaks, and all through the mountain forests of the West, Spruces and Firs and Pines are being replaced by miserable Aspens. Mismanagement growing out of disregard of the simplest laws of nature and of economy is slowly destroying the fertility and changing the character of the plant-covering of the whole North American continent. Such forces of nature work slowly, and the results, perhaps, are hardly noticed from generation to generation of men. But at length people, like our correspondent, begin to ask themselves, "Why is it that this land which, when it was first known, was covered with great forests of Pine, now only bears a feeble growth of stunted Oaks, and what has become of the fertility for which this region was once so famous?" It is easier to find the answer to such questions than it is to suggest the remedy for the conditions which give rise to them. But with such examples before our eyes as all the earliest-settled parts of this continent afford, there seems little excuse for the condition of things which already begins to prevail even in those regions where the balances of nature have not yet been seriously, or at least not irreparably, disturbed.—Ed.]

To the Editor of Garden and Forest:

Sir.—It would not be safe, in my opinion, to trust to the innocuous character of that variety of *Rhus toxicodendron* with entire leaves upon such negative evidence as that presented in the communication published in your journal of February 6th. It is, of course, generally impossible for the physician to determine which variety has produced the cutaneous inflammation in individual cases, as the patient is almost always ignorant of such distinctions in the forms of leaves, even if able to recognize the plant at all.

I have in my office mounted, dried specimens of all the varieties of foliage of *Rhus toxicodendron* and *R. venenata*, and have frequently asked intelligent patients to point out which of the forms was the culpable agent in their case, and have seen no grounds for regarding the lobed leaflets of *R. toxicodendron* as more virulent than those with entire edges. I was certainly acquainted with one vine of the latter variety, which had been cultivated upon a building in ignorance of its nature, which severely poisoned at least two or three persons in one season. The great majority of persons are not affected by either variety.

It is interesting to know that persons "especially subject to Ivy poisoning" escaped last season, as described by your correspondent.

James C. White.

Boston, Feb. 7th.

To the Editor of Garden and Forest:

Sir.—In a recent number of a western horticultural journal I find the following: "Have you ever walked along the street of some city and observed the fragrance arising from the baskets of certain 'Rose seed' or 'Lavender bloom' venders? Well, when you do see them, don't invest in these wares unless you enjoy being fooled. The articles are offered for placing among clothes, and are 'warranted' never to lose their fragrance, but a dozen times a day the venders retire for a bit, and in some unobserved place squirt perfume over their stock to keep an odor about it. Anything that rattles in the envelopes does duty for the seeds or dry leaves."

Here in New York such frauds are common, and it seems as though there should be some way to prevent ignorant purchasers from being thus imposed upon. Not long ago I saw several peddlers on Twenty-third Street who were actually offering "Attar-of-Rose seed" for sale—the seed, that is, not of a plant, but of a perfume! There could hardly be a more transparent deception, yet it seemed to find many victims. From curiosity I ranked myself among them, and bought a ten-cent package of what looked like Pumpkin seeds. In twenty-four hours, of course, the strong scent which the package had emitted was wholly gone. On the other hand, the Lavender which is often sold on our streets in autumn seems to be the genuine article, may be bought either in dried twigs or in a powdered form, and keeps its delicate, fresh odor for a considerable length of time.

W. K. G.

New York City.

To the Editor of Garden and Forest:

Sir.—It may be interesting to note that *Nymphæa odorata* occasionally grows out of water. At Baury's Lay, on Buzzard's Bay, in 1888, pools which are such in spring, but which in summer are absolutely free from surface moisture, so as not to even dampen the shoes in walking over them, abounded with this plant. The leaves were large, but not unusually large, short petioled and healthy. The blooms had very short peduncles and the flowers were far larger than those that were found in water near by. It is not uncommon to notice the *N. odorata* blooming luxuriantly on the edges of ponds where the water has retreated, but this is the only instance I have observed of their growing when the ground was dry, without moisture in reach of discovery by digging with a jack knife.

It is not generally understood that some marsh plants will thrive far better in proper soil, different from their natural habitat, than in a state of nature. This instance given above is an analogous illustration with a water plant. It would be well for some of our cultivators to make a trial of growing the Pond Lily in the same manner as the Calla is now treated.

E. Lewis Sturtevant.

South Framingham, Mass.

Recent Publications.

Gartenkunst und Gaerten Sonst und Jetzt. Von H. Jaeger, Berlin, Paul Parey.

This book, the title of which may be somewhat clumsily translated as "Gardening Art and Gardens in Former and in Present Times," is one of the most valuable to the student of the subjects with which it deals that has yet been published. Its author holds the position of Royal Garden Inspector at Eisenach, and had published in 1877 a "Handbook of Gardening Art" for the practical instruction of members of his profession, which, we believe, is regarded in Germany as one of the best works of its class. The present work is primarily a popular history, not a theoretical or practical treatise. Yet the author's long personal experience in the planning and conservation of gardens, and the didactic habit of mind characteristic of the German intellect in general, have combined to bring within its covers many pages and incidental paragraphs of a theoretical, explanatory, and directly instructive sort. The reader, therefore, may learn from it not only what have been the efforts of gardeners in every age of the world, but how those efforts resulted from the point of view of abstract beauty, and also how they may best be utilized as precedents for modern practice. It is primarily a history, but, likewise, as its sub-title indicates, a general guide-book for the gardener, architect and amateur. The architect, especially, may learn much from its pages, for seldom has a treatise been written in which the respective qualities and claims of architectural and of gardening art are so systematically considered in the only right and proper way—that is to say, not separately, as the qualities and claims of two

rival arts, but together, as those of sister arts, each of which is dependent upon the other and neither of which can be properly practiced or appreciated if the other is left out of mind. Moreover, while most extended treatises on the history of gardening have been issued in large and costly tomes, this one forms but a single volume of about 550 pages of large octavo size, and costs less than $5. Of course its illustrations are not so beautiful as those in more sumptuous and costly books; but they are very well selected; their number (250) makes up for their lack of size; the recent development of photographic art has permitted the inclusion of pictures of many gardens not hitherto familiar to the student's eye, and the numerous plans are clearly printed and sufficiently large to be easily understood. In short, the book is the most useful one of its kind of which we know; none in French or English exactly fills its place as being at once scholarly in point of view and popular in tone, and the gardener, architect or amateur who can read it in German is to be envied by his less fortunate fellows.

The introduction is one of the most interesting chapters in the book. It explains, among other things, that in all the earlier ages of the world, when a great part of the earth's surface remained in its primitive condition, formal gardens were exclusively created, natural gardens taking rank as works of art only when the savage beauties of nature had been so far subdued that a modified return to them meant novelty and refreshment for the soul of man. The first chapter deals with the gardening art of Egypt, Asia Minor, Persia, and Greece and its colonies. A long chapter on Roman Gardens follows, and a necessarily shorter one—for here the subject itself is less rich and sources of information are slenderer—on mediæval developments. The Italian Renaissance is then taken up, and its period of full bloom—when such men as Michael Angelo and Giulio Romano concerned themselves with the laying out of gardens—is fully treated. The spread of Italian ideas and their degeneracy into barocque, puerile and grotesque phases is then followed; next Dutch gardens are discussed, and then, at great length, the famous French period. The eighth chapter deals with the rise of true landscape-gardening in England. The ninth is devoted to the art of China and Japan, and the influence it had upon English development. Then this development is followed as it spread over the continent of Europe. Modern German gardens follow, then modern gardens in the rest of Europe, and in non-European countries, especially in America. German gardens in their estate to-day have a chapter to themselves, as do the useful gardens of the world—botanical gardens, cemeteries, winter-gardens, etc. And in a final chapter the present condition and the prospects of gardening art are theoretically considered. From this brief summary it will be guessed how rich Herr Jaeger's book must be in historical material. It is impossible within the limits of a mere review to summarize any of its historical chapters. Next week, however, we shall print some extracts having reference to American gardens, which we think will be of peculiar interest to our readers. And meanwhile we may quote a few counsels of a general sort which Herr Jaeger puts into particularly effective shape.

One of the great mistakes of modern theorists and practitioners, he says, is that they feel themselves obliged to take sides with one or the other of the great camps into which the gardeners of all time may be divided. They feel it incumbent upon them to declare distinctly in favor of the formal or of the natural style of gardening, and to exalt their chosen style to a degree which means the total denial of all worth or beauty in the other. In former times the same spirit has often manifested itself, as when, during the bloom of English landscape-gardening, countless beautiful old formal gardens were destroyed—in England itself and on the continent as well—to make room for novel arrangements often less harmonious and appropriate, and therefore less desirable in the given situation, than the arrangements they replaced. To-day almost every artist and amateur likewise professes himself a champion of the natural style, and refuses to consider the claims of architecture to a semi-architectural environment in the landscape. But the true aim of gardening art to-day, writes Herr Jaeger, should be "to unite both gardening styles—the pictorial (natural) and the symmetrical (architectural or formal)—or to use them alternately, as the exigencies of the site and of the dominant building demand the one or the other." His preference seems to be for a combination of both; not for a mixture of the two, in a disorderly, inartistic scheme, but for such a juxtaposition of contrasted elements, properly connected together and gradually leading the one into the other, as will properly support a building by symmetrical features and yet give true landscape beauty in remoter portions of the domain.

A certain measure of symmetry and architectural dignity in a garden is, indeed, naturally desired by the civilized eye; and when it is not supplied in right artistic ways is almost sure to be grasped in ignorant and inartistic ways. Theoretically, we ask only for natural effects in our gardens, and might be surprised to hear that we are always trying, in spite of theory, for symmetry and formality in line and color. But what other explanation can we give of the universal intrusion into our public and private gardens of geometrical ribbon-beds and borders, and of masses of exotic plants whose foliage is strictly architectural in character?

In this connection a final paragraph may be quoted from Herr Jaeger's pages. As bright-foliaged plants, he says, "form a contrast with the green of the main plantations, they ought to be very sparingly employed in their neighborhood. But to-day many gardeners and proprietors confuse rarity with beauty, and plant more of these bright-hued plants than is desirable—and sometimes such as are wholly insignificant intrinsically, or actually ugly. In general, the effort to introduce unfamiliar plants into a garden is a fashionable folly which can easily prove very dangerous to beauty in the result."

In conclusion, it is proper to say that Herr Jaeger's treatise has been somewhat severely criticised during the year since it appeared with regard to certain matters of historical detail. Dutch writers have accused him of patriotic bias in exaggerating the rôle which German artists played in Holland; and Austrian writers have accused him of unpatriotic bias in exaggerating the rôle which French artists played in Germany. Both accusations are based upon his account of certain individual gardens. But it must be remembered that the history of old gardens is often difficult to decipher, as they have largely lost their original estate under the successive retouching of generations of gardeners. And the main point, for the American reader at least, is not to know just who laid out this or that old garden, but to grasp the general course of the art, and the differences between its typical manifestations in this country and in that. As supplying a basis for such knowledge, we find Herr Jaeger's book all that a student could ask, while it is very pleasant reading even for those who have no serious desire to retain and put in practice the information it supplies.

Periodical Literature.

Bordeaux, which is one of the principal centres of the Vanilla trade, imports, according to the *Gardeners' Chronicle*, over 5,000 pounds annually. Most of the Vanilla imported comes from the French colony of Réunion, where the culture is of comparatively recent date. By the local dealers Vanilla is classified into four qualities. The pods of the first measure from seven to nine inches long; they possess the characteristic perfume in a greater degree than the other sorts. The Vanilla-vine, it is stated, is at times covered with efflorescence of a silvery brilliance, producing a crystallization similar to that found in the pod, and which in good specimens covers the outside of the pod. This is called Vanilla-vine, and is in great demand in the Bordeaux market. Two different methods prevail for preparing the pods for market. The first consists of harvesting the capsules after they have lost their green tint. Woolen sheets are spread upon the ground, and when thoroughly heated by the sun the pods are spread upon the sheets and exposed to the sun for a certain period; they are then put into the boxes, covered by a cloth and exposed to the sun. The fruit should assume a coffee color in twelve or fifteen hours after this last exposure. If this color is not obtained, the Vanilla is again submitted to the heat of the sun. This process occupies about two months, at the expiration of which the Vanilla is packed in tin boxes containing about fifty pods each and securely packed.

The second process consists of tying together about a thousand pods and plunging them into boiling water to bleach them, after which they are exposed to the sun for several hours, and then coated with oil or wrapped in oiled cotton to prevent the pod from bursting. During the drying the pod exudes a sticky liquid, the flow of which is promoted by gentle pressure of the pods two or three times a day. In the course of preparation for market the capsule loses about one-quarter of its original size.

The latest mail reports from Mauritius estimate that the outturn of the coming crop in that island will be a small one, and will probably not exceed 34,000 pounds. The present market price in London for Vanilla is very good, ranging from eight shillings per pound for common to twenty-three shillings for fine sorts.

Notes.

During 1888, 100 car-loads of Lima Beans were shipped east from Santa Barbara, California.

Colonel E. T. Ensign has just been re-appointed to the office of Forest Commissioner of the State of Colorado, his present term being about to expire.

M. Godefroy-Lebeuf's new book upon Cypripediums is dedicated "*A la Gloire de la Maison J. Veitch & Sons, de Chelsea.*" The first part has just appeared.

Mr. H. A. Siebrecht, the well-known florist of this city, has been collecting plants in the West Indies. He writes that he has found a number of promising novelties in the mountains of Grenada.

The first number of a new Portuguese horticultural journal, "*O Floricultor*," has been issued. It is published in Oporto, and in Portuguese, with the exception of one column, "*pour les 'Etrangers.*"

At a ball recently given in New York, one apartment was exclusively decorated with Apple blossoms, another with Magna Charta Roses, a third with Orange trees in pots, and a fourth with Jonquils and blue Roman Hyacinths.

A German horticultural paper states that during the year which has recently closed no less than ninety-six new varieties of Roses were introduced into the European trade. Thirty-one florists shared in their introduction, and the list includes thirty-seven varieties of Remontant Roses and thirty-one Tea Roses.

The so-called "joss-sticks," the burning of which supplies incense for Chinese religious ceremonials, are made of the powdered leaves of *Lindera fragrans* mixed with the powdered roots of *Biota*. *Lindera fragrans* is a shrub of the true Laurel family (*Lauraceæ*), and its Chinese name means "Incense Leaves."

The Council of the Royal Horticultural Society of Great Britain intends to hold a Conference of Rosarians at the Chiswick Gardens on the 2d and 3d of July next. An exhibition of the species and varieties of Roses will be given the first day; and papers on Roses and their culture and origin are invited, and will be read and discussed during the second day.

The Royal Society of Agriculture and of Botany of Ghent will hold on the 23d of next November a grand international exhibition of Chrysanthemums, in honor of the centennial anniversary of the introduction of this now popular flower into Europe. Prizes are to be offered for the best specimens of primitive types, and for the best seedling varieties not yet in commerce.

The February issue of the Kew *Bulletin of Miscellaneous Information* is devoted to a list of the hardy herbaceous annual and perennial plants which matured seeds in the Royal Gardens last year. The seeds are available for exchange with other botanical establishments, but are not sold to the general public. This list makes a useful, although, of course, only a partial catalogue of the plants of this class cultivated in the Royal Gardens.

Flowers of the Japanese Apple (*Pyrus baccata*) have appeared this week in the window of a Broadway florist. Judged from the specimens displayed they seem to lack substance for winter forcing, and are less beautiful at this season of the year than might have been expected. The flowers of this tree are always more beautiful in bud than when fully expanded, and the branches should be cut before the flowers open if their real decorative value is to be obtained.

The twenty-second biennial meeting of the American Pomological Society was held at Ocala, Florida, on Wednesday, Thursday and Friday of last week. The attendance was large, all parts of the country being well represented. In the discussions, which were of the most interesting character, special attention was given to the fruits grown in Florida. The officers elected were: President, P. J. Berckmans, of Georgia; Vice-president, T. T. Lyons, of Michigan; Treasurer, B. G. Smith, of Massachusetts; Secretary, A. A. Crozier, of Iowa. Members were entertained with generous hospitality by the Horticultural Society of Florida, at whose invitation the meeting was held in that State. The exhibition of semi-tropical plants is said to have contained the most complete and best classified collection of citrus fruits ever made in Florida.

At a recent meeting of the Royal Horticultural Society of Aberdeen it was stated that one acre of Mushrooms in "our own country" (the exact locality not stated) had produced a crop valued at about £1,450, of which more than £950 was clear profit, while near Leeds one-sixteenth of an acre had produced 3,000 pounds of Mushrooms, which means a crop worth about £1,600 to the acre. Another speaker, on the same occasion, treating of the forestry needs of the country, said that so long ago as 1457 proprietors were ordered by government to plant trees; that in 1503, in Scotland, a fine of £5 was imposed on any one who cut down a tree, so entirely had the land been denuded of wood; that thirty years later stringent regulations were passed with regard to the extent of land which the larger proprietors were annually to plant with forest trees, and the death penalty was affixed to the third offense in the way of tree-cutting. But the last decree of an analogous nature was passed in 1661, since which time no legislation has dealt with the subject.

According to the *Carpenter and Joiner*, New York is now the largest mahogany market in the world. Thirty years ago Mahogany was known commercially as "St. Domingo," from the island of St. Domingo, and "Baywood," or "Bay Mahogany," from the vicinity of the bay of Honduras in Central America. The Central American wood was soft, of light weight, and characterless; in later years it has practically ceased coming to this market, but one cargo having arrived at the port of New York during the last six years. St. Domingo Mahogany exists in name only. The original growth of this wood on the island of St. Domingo has long since been used, and the importation of small lots at exceedingly long intervals are only of the small and stunted growth, crooked, stained and defective. Individual logs of good size and quality can be secured only occasionally. The island of Cuba furnishes considerable quantities of a smaller size, more especially valuable for small work, which is hard and of good texture, but the great bulk of the mahogany used in later years is supplied from the forests of Mexico. Southern Mexico produces not only our largest and most beautiful grades of mahogany, but also some of the softer and less desirable grades, somewhat resembling the Baywood or Honduras Mahogany of olden times.

The schedule of prizes offered during the current year by the Massachusetts Horticultural Society, amounting to $6,000, has appeared. One-half of the amount is offered for plants and flowers; $1,700 for fruits; $1,000 for vegetables, and $300 for gardens and green-houses. There are also "prospective prizes" derived from the "Benjamin B. Davis Fund," for the originators of seedling fruits, flowering plants and vegetables which are not awarded until a satisfactory trial, extending through several years, has established the real merit of the variety. Such prizes as these last are calculated to develop horticulture in the most practical and useful manner. There are some curious anomalies in this schedule of prizes which will strike all practical horticulturists. For example, a $3 prize is offered for four bunches of Radishes; $4 for six pots of Roman Hyacinths; while the best specimen plant among the Indian Azaleas can win only $4—no great inducement to any one to run the risk of ruining a good plant, which may represent twenty years' careful cultivation. Prizes of $3 for ten cucumbers and of the same amount for a peck of Dandelions are certainly liberal, when the highest prize four Heaths can get is only $8. The largest and best collection of blooms of hardy trees and shrubs may win $6, and on the same day twelve Beets or twelve stalks of Rhubarb may aspire to carry away $3 each. "Stove and green-house flowering plants," if they are not Orchids, do not get much encouragement, but on the 25th of June "two distinct named varieties" can carry away $10, and on the same day twelve Beets, if they are good ones, can earn $3. Beets seem to be favorites in Boston. The successful cultivation of Chrysanthemums is held to be most worthy of reward, as the highest prizes offered by the Society for flowering plants go to the best collection of twenty named varieties. Æsthetic considerations have, nevertheless, due weight when the garden prizes are in question, for $60 goes to the "best House of Orchids in bloom," while the fortunate owners of the "best Strawberry-garden or the best vineyard of one acre" must each be contented with $50.

Catalogues Received.

C. E. ALLEN, Brattleboro, Vt.;—Seeds, Plants, Small Fruits, etc.—R. & J. FARQUHAR & Co., 16 South Market Street, Boston, Mass.;—Seeds, Plants, etc.—GREEN'S NURSERY Co., Rochester, N. Y.;—Fruit Trees, Ornamental Shrubs, etc.—JOHN R. & A. MURDOCH, 508 Smithfield Street, Pittsburgh, Pa.;—Vegetable and Flower Seeds, Plants, etc.—VILMORIN-ANDRIEUX & Co., 4 Quai de la Mégisserie, Paris, France;—Seeds, etc.